Rivers and Streams

For more information on this project, please contact:
Bryan Bakevich , Clay Pierce, and Michael Quist
Department of Natural Resources Ecology & Management
Iowa State University
Ames, Iowa 50011
bryan.bakevich@state.nm.us, cpierce@iastate.edu

Distribution and Abundance of Topeka Shiners in West-Central Iowa

Since the arrival of European settlers nearly three hundred years ago, the landscape of Iowa has changed dramatically. The conversion of tall-grass prairie and forests to agricultural and urban land has contributed to the decline or extinction of many its native species. The Topeka shiner Notropis topeka, a fish native to Iowa prairie streams, is one such species that has declined in both abundance and distribution throughout its historic range. Although this fish is known to inhabit streams, it has recently been found in off-channel habitats such as oxbows. In 1998, concern for the survival of this species led to its listing as endangered under the Endangered Species Act. The goals of this legislation are to reduce further extinction risk and to develop and implement a recovery plan for the species. However, certain information about the species, such as distribution, abundance, and habitat requirements are needed to make well-informed management decisions. Since small streams and off-channel habitats are rarely sampled in Iowa, our knowledge of Topeka shiner ecology in Iowa remains limited. This research will provide the fundamental information that is needed for a successful recovery effort. The specific objectives of this research are to (1) determine the distribution of Topeka shiners and (2) define abiotic and biotic factors associated with the occurrence of Topeka shiners in west-central Iowa.

In 2012, data collected from the previous two years were analyzed and the results were presented in a master's thesis and submitted for publication in the North American Journal of Fisheries Management. Our formal modeling suggested that Topeka shiner occurrence is associated with an increase in fathead minnow catch per unit effort (CPUE) and submerged aquatic vegetation. The fish assemblages of Topeka shiner and non-Topeka shiner off-channel sites also differed. Topeka shiners were detected in oxbows that contained more lentic and tolerant species such as fathead minnow and common carp. Topeka shiners occurred more often and were more abundant in off-channel habitats. Reproduction was also documented in off-channel habitats further suggesting that restoration of these habitats could have a positive effect on Topeka shiners.

Progress on a study examining the seasonal changes of fish assemblages in off-channel habitats continued in 2012. Habitat, fish, and water continuous water level data were entered and analyzed. Preliminary results indicate Topeka shiners, as well as several other fishes, tend to be colonizers of recently flooded off-channel habitats. These data will be further analyzed and included in a report to the Iowa DNR.